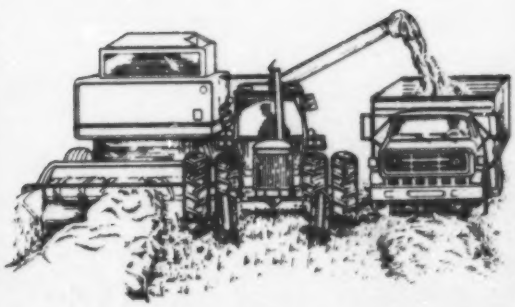
Saskatchewan
Agriculture

Economics
Branch

Farm
Management

# Maximum Economic Yield For Maximum Profit



# Maximum Economic Yield For Maximum Profit

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Agriculture**

## Foreword

In the past 60 years farmers have been attempting to produce a maximum profit from the land they farm. The successful farmers have received the greatest return per acre regardless of location or commodity prices. This bulletin stresses that good farm managers are producing the highest profit per acre or are producing at the maximum economic yield (MEY).

Their success is achieved through continuous planning. Maximum profit is accomplished by an integrated crop production plan. Each input or management decisions interaction is carefully considered and evaluated. Production is increased through the effective use of input costs and cultural practices until the marginal revenue is equal to the marginal cost.

To estimate marginal returns a farmer must calculate whether each input has a high or low return on investment. Farmers must implement all the no cost and high marginal return items.

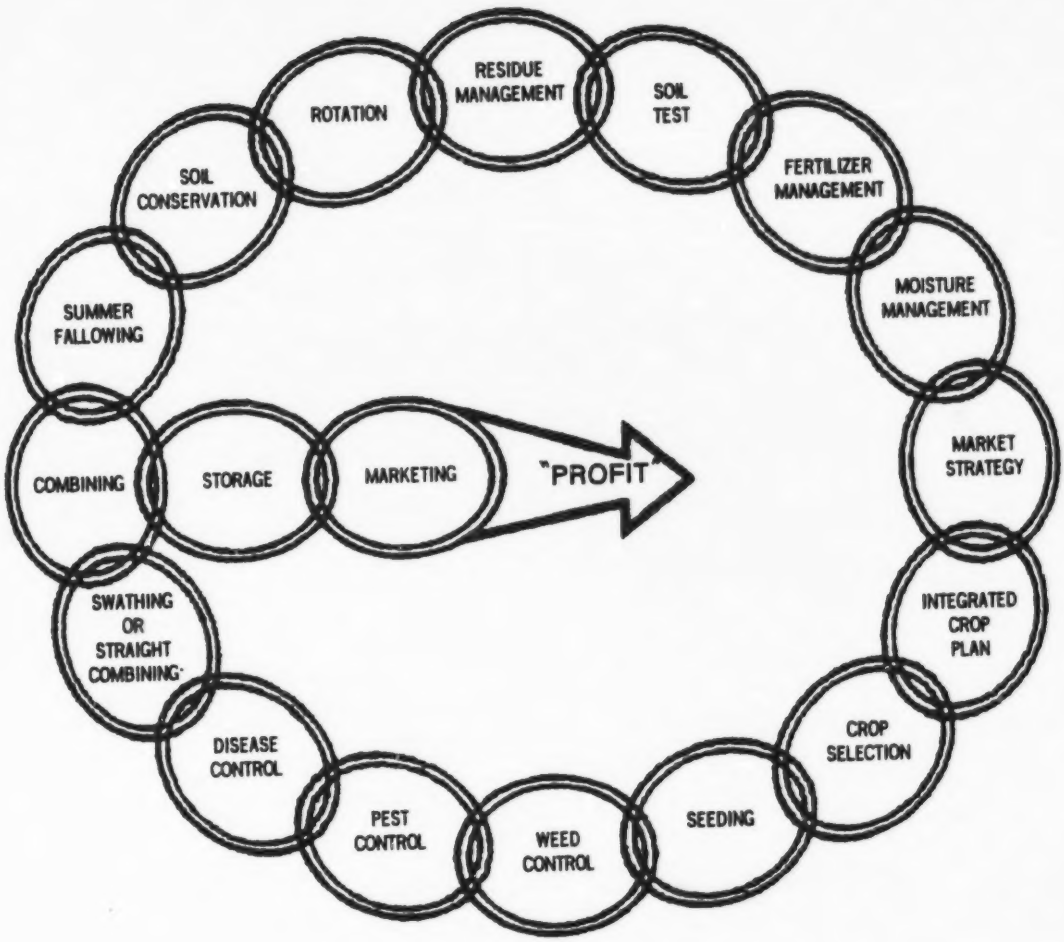
MEY or producer clubs are discussed and a list of guidelines are outlined to successfully establish such clubs.

A Management Package Checklist and Record Sheet are included to ensure farmers consider all management decisions and maintain accurate records for future planning.

For further information or additional copies of the publication contact your Agricultural Representative, Regional Farm Management Specialist or the Farm Management Section of Saskatchewan Agriculture, Room 329, Walter Scott Building, Regina, Saskatchewan, S4S 0B1.

Farm Management Section
Economics Branch
Saskatchewan Agriculture
March 1987

## Maximum Economic Yield




**Are you maximizing your profits?**

**How strong is your production chain?**

**Which factor is your profit limiting link?**

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## INTRODUCTION:

Under the present economic conditions, it is most important for a farm manager to clearly focus on his goals. One goal should be to maximize net profit from his time, labour and capital. This is becoming more difficult as land, machinery and variable costs remain high when compared to grain prices. At the current commodity prices, it is difficult to reduce costs of producing an average yield to the point where profit can be made. This means that a farm manager must determine the profit associated with different yields. It is more important to produce the maximum profit per acre rather than to produce the highest yield. A farmer who can produce each bushel for the greatest profit will be in the best position to deal with the uncertainities associated with crop production and prices.

In order to achieve a profit goal, a farmer must plan a complete management program. Profit is the product of price per bushel and quantity or yield minus the total costs, making the marketing, production and input costs equally important.

$$\text{Profit} = (P \times Q) - C$$

Profit can be increased by making wise decisions in purchasing inputs, in producing a most profitable yield and in the use of marketing strategies in selling of grain and other products.

This publication will outline the factors to be considered and provide an explanation of the theory involved in determining the yield that will result in maximum profit. Information is provided on setting up production groups as well as an example of a cost of production worksheet to be used in determining the cost of crop inputs and farm practices.

## MAXIMUM ECONOMIC YIELD (MEY)

MEY is defined as the yield that produces the highest possible net profit obtainable for a season on the site, field or farm. It is obtained by using optimum timing, effective cultural practices and the proper combinations of all production inputs.

Positive interactions must occur in the crop to produce the MEY. MEY is achieved when the crop response to the combined treatments is greater than the sum of two or more inputs individually. Increases in yield will come primarily from the interaction of crop inputs and combinations of cultural practices.

The maximum economic yield is reached when the marginal revenue equals marginal cost or the last dollar spent to produce a crop returns only a dollar. A farmer must estimate a marginal return on all inputs and cultural practices individually or as they cause a positive interaction and yield response.

There are several other terms to describe programs that assist farmers in reaching their maximum economic yield. The Canola Council of Canada has adopted a program titled **"ATTENTIVE CROP MANAGEMENT (ACM)"**. The word "Attentive" puts the onus on attitudes and personal management skills of the farmer.

**OPTIMUM YIELD (OY)** is another term which implies the ultimate yields for maximum profits.

**INTEGRATED CROP MANAGEMENT (ICM)** is used to stress the importance of combining all the crop inputs and management practices into a complete package for MEY.

These terms, although they may show a different emphasis, describe the yield or production package which will achieve the maximum profit for any given acre. In this publication the term Maximum Economic Yield (MEY) will be used to describe the yield or production system which will result in the maximum profit per acre.

MEY is achieved by paying close attention to all crop production factors and putting together a well balanced, integrated crop program. It is important to be cognizant of the interaction among the different crop production factors and also of how these interactions change as crop yield goals are increased. Being simplistic, there is no advantage for increased fertilizer application unless you have adequate weed control.

A farmer must remember the PRINCIPLE of LIMITING FACTORS. "The level of crop production can not be greater than that allowed by the most limiting of the essential plant growth factors." In other words, yields are limited by the weakest link in the production chain.

Farmers will continually be supplied with yield improving information, however, its up to the individual to analyse and interpret how each new product or practice will affect his MEY. Its important to have the ability to analyse, change and adapt.

### Methods For Obtaining The MEY

To obtain MEY a farmer must explore the horizon, operate test plots, test new products and ideas and observe many neighbouring fields. By doing this you can analyse the reasons for successes and failures and determine the yield limiting and yield contributing factors. The best way for a farmer to accept new ideas is to prove the benefits of a new concept or product on his own farm. Studying crop responses to different inputs can only be accomplished with the development of an accurate production record keeping system.

Its also necessary to have accurate farm financial records to know your current production costs, including the cost per bushel and return per acre. An individual's MEY goal is a moving target. It will shift from year to year depending on changes in input costs, prices received for commodities and the adaptation of new technology.

As commodity prices and production costs fluctuate, the MEY principle of maximuming profit per acre remains the same. An individual farmer, however, must adjust components of his program accordingly to compensate for changes in input costs, commodity prices and technology.

Assuming a farmer has been operating at his MEY in the past, how should he react if grain prices shift? As grain prices fall, for example, a farmer must reduce his costs of production and accordingly reduce his projected yield goal. The yield at which the marginal returns equal the marginal costs for any input are lower at reduced grain prices. The use of fewer inputs should only be considered, however, if the farmer is presently producing at his MEY and his cost per bushel must be reduced due to falling grain prices.

In many cases, farmers are not producing up to their MEY and must increase inputs to increase profitability.

## RISK MANAGEMENT

The farmer must analyse the immediate risk to his crop and the long term risk to his farm. The economic priniciple of marginal return shows a marginal profit yield or MEY is obtained when marginal revenue equals marginal cost or the last dollar spent to produce a crop returns only a dollar. This represents the "perfect situation."

In order for a farmer to reduce his risk, he may decide to stop his inputs at the point where a dollar input produces something more than a dollar profit. These risk management decisions must be made on each individual situation.

Farm managers must protect themselves against the risks of lower yields and prices. MEY management can increase a farmers chance for profit in the face of the uncertainties of nature. Higher yields help make a farmer much more flexible in his marketing since he can withstand a larger price drop before suffering a loss. A higher yield goal also gives a farmer a wider spread between potential maximum profit and loss.

Producing at the MEY helps the farmer build higher profits and a healthy hedge against losses when prices, yields or both are lower than expected. Remember, the MEY system attempts to produce the maximum profit regardless of prices or yields.

Profit goes to those who take the risk of putting management and labour into something without a guarantee. A farmer must be willing to accept the responsibility for his decisions and risks.

## COST MANAGEMENT

### 1. PRODUCTION COSTS

Its a necessity of a crop management system to lower the unit cost of production during tough economic times. Many production costs remain unchanged regardless of yield. These are called fixed costs. When considering fixed costs, its important to produce high yields to reduce the cost per unit produced. For example, a farmer who has purchased land at high prices with high interest rates has higher fixed costs and therefore needs higher yields to cover these costs. Usually variable input costs are only a small proportion of the total costs involved in producing a MEY. Many additional management factors cost little or nothing to implement.

**Table 1: LANDMARK HIGH YIELD WHEAT CLUB 1984**

| GROWER | ACRES | YIELD bu/a | FERTILIZER COSTS $/a | TOTAL COSTS $/a | GROSS PROFIT $/a | NET PROFIT $/a | UNIT COST $/bus |
|---|---|---|---|---|---|---|---|
| AVERAGE (of 13) | 70 | 53.8 | 42.29 | 163.50 | 227.94 | 64.44 | 3.04 |
| TOP | 50 | 75.5 | 48.24 | 167.28 | 313.33 | 146.05 | 2.22 |
| LOW | 100 | 42.5 | 33.00 | 161.27 | 182.75 | 21.48 | 3.79 |

SOURCE: "The Potential and Practical Application of Intensive Cereal Management Techniques in Saskatchewan" a report prepared by the Western Canadian Wheat Growers Association.

This club is sponsored by Landmark Agro Ltd. in the Red River Valley of Manitoba. As can be seen in Table 1, there is only a 5% difference in total costs between the low and high producer. However, a 33 bushel per acre higher yield was achieved resulting in a $125 per acre difference in net profit and a 41% reduction in per bushel production costs. This illustrates how higher yields affect the per unit cost of production.

Remember, the use of fewer inputs should only be considered if the profit per acre is not adversely affected. In some cases, it may be necessary to increase inputs to increase yields and profitability. Table 2 shows this effect for various farm management levels.

**Table 2: MEY CROP PRODUCTION BUDGET (WHEAT)**

| EXPENSE | AVERAGE FARM | TOP PRODUCER | MAXIMUM YIELD | MEY |
|---|---|---|---|---|
| seed | 4.00 | 5.00 | 9.00 | 6.00 |
| seed treatment | - | 1.00 | 2.00 | 2.00 |
| fertilizer N | 5.00 | 7.00 | 15.00 | 12.00 |
| P | - | 5.00 | 12.00 | 10.00 |
| herbicide grassy | - | 6.00 | 12.00 | 7.00 |
| broadleaf | 3.00 | 4.00 | 8.00 | 8.00 |
| fungicide | - | - | 10.00 | 5.00 |
| growth regulator | - | - | - | - |
| insecticide | - | - | 10.00 | 6.00 |
| application costs | - | - | 10.00 | 5.00 |
| operating interest | 10.00 | 10.50 | 15.00 | 12.00 |
| machinery operating | 20.00 | 20.00 | 20.00 | 20.00 |
| insurance | 5.00 | 5.00 | 5.00 | 5.00 |
| taxes | 3.50 | 3.50 | 3.50 | 3.50 |
| depreciation | 30.00 | 30.00 | 30.00 | 30.00 |
| labor and capital | 50.00 | 50.00 | 50.00 | 50.00 |
| TOTAL EXPENSE | 130.50 | 147.00 | 211.50 | 181.50 |
| AVERAGE YIELD (bu) | 35 | 43 | 58 | 55 |
| GROSS INCOME ($4.00/bu) | 140.00 | 172.00 | 232.00 | 220.00 |
| NET PROFIT/ACRE | 9.50 | 25.50 | 20.50 | 38.50 |
| BREAKEVEN YIELD | 32.6 | 36.8 | 52.9 | 45.4 |
| COST/BU | 3.72 | 3.42 | 3.65 | 3.30 |

The farmer, using the MEY principles, maximizes his profit per acre at $38.50. The key to his success is the fact he is receiving a marginal return on all possible inputs invested in his crop production.

Even though wide differences in crops and input prices are used, MEY is usually very close to maximum yields. **Its important to remember that maximum yields are for researchers while maximum economic yields are for farmers.**

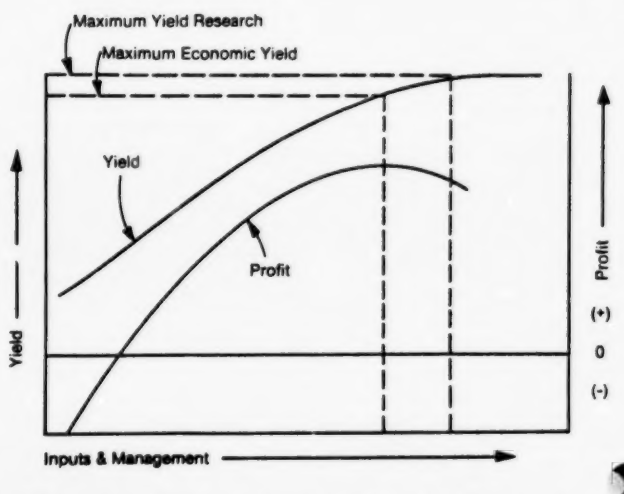


Figure 1. The difference between maximum yields obtained with research and maximum economic yields where profits are maximized.

It doesn't necessarily cost money to produce the MEY, since it maximizes profits at each input level. The principles of producing at the MEY are the same regardless of where you farm, what your average yields are or your economic situation. Its important to adapt the principles to your particular situation. For example, a $10 fertilizer input could produce a $20 return whether your average yields are 20 bushels/acre or 40 bushels/acre. If cash flow is limiting, then the investment must produce a profit over and above the additional interest charge. The additional return must cover the cost of input plus operating interest to be financially sound.

**2. PLANT MANAGERS**

The Potash and Phosphate Institute describes farmers as "plant managers." In the manufacturing world, plant managers are judged by their productivity. The key to any business is improved productivity.

Farmers who manage their "plants" for maximum profit will be financially successful. They will reap higher profits if prices turn upward, or reduce possible losses if prices continue poor. Factories can't operate at 80% capacity; neither can farms. It is imperative farmers do the very best job on each acre they have in production. Its been said that "Good times breed inefficiency, while hard times breed good management."

**3. COST OF ACTION VERSUS INACTION**

Before implementing MEY principles, a farmer must consider the cost of action verses inaction. The cost of inaction may not show up on the current financial statement, however it will over the long term. The value of the lost yield could be far greater than the cost of extra inputs.

The cost of action is really just the cost of following agronomic recommendations. Producing at the MEY places greater emphasis on production and marketing management. There would only be added costs if present practices are not adequate. Then the added cost would be a good investment. Its more important to implement current recommendations than to increase inputs. For example, its cheaper to improve efficiency of fertilizer through proper timing and application than to increase application rates. Decisions to adopt improved production practices are made by considering added costs versus added returns due to change in practices.

Those who take action risk failure; however the return to risk is profit.

## MARGINAL RETURNS

Like any financial investment, a farmer must invest his money in the input which returns the maximum profit. When applying the MEY principles, he must analyse which crop input or management practices gives the greatest marginal return or profit for any dollar invested. To accomplish this a farmer may list all his crop input and production practices into one of three categories:

**1. NO COST**

There are a wide variety of recommended production practices which can significantly increase profits at no cash cost. These factors do require considerable time commitment however, they pay a very large return on investment.

Some examples include:

a) timeliness of all operations
b) becoming completely informed on herbicide or pesticide products (rates, residues, etc.)
c) choice of rotation and crops
d) market analysis of world grain inventories and specialty crop options
e) proper seeding rate
f) proper seeding depths

With these and other examples a farmer can significantly increase his profits with a minimal amount of time investment.

**2. COST - HIGH RETURN**

With this type of input a farmer must carefully analyse his return on investment and spend his money where he nets the maximum marginal return.

These decisions could include:

a) soil testing
b) optimum fertilizer and herbicide application
c) field scouting to determine possibility of spot spraying
d) summerfallowing with economical herbicides
e) early purchase programs

**3. COST - LOW RETURN**

These are the costs which have little effect on the net profitability of the farm. A farmer must try to reduce these costs whenever possible.

Some obvious examples may include:

a) new vehicles
b) being over equipped
c) excessive labour
d) ineffective herbicide and/or fertilizer application

On a general basis however, it is very difficult to distinguish between costs that have a high return and those with a low return. One input may be a high return item for one farm or area yet may be a low return item for another farm or area. For example, fall tillage in the north may be high return for seed bed preparation; however, in the south it might be a low return cost due to moisture loss.

Farmers should list all the crop inputs and management practices into one of these three categories. It is essential in cost management to forecast the economic return for every crop input. Some of the inputs which may be more difficult to distinguish between high return and low return include:

1. soil moisture conservation
2. certified seed
3. seed treating
4. fertility levels
5. herbicide costs
6. grain drying
7. new equipment versus repair and maintanence
8. hired labour
9. summerfallow versus extended rotations
10. chemical fallow versus conventional fallow
11. fertilizer banding versus broadcasting
12. swathing versus straight combining
13. seed bed preparation

All of the factors must be analysed on an individual farm basis. Good managers will forecast the effect of each input and practice and only implement the no cost and cost-high return items. Consideration must also be given as to how a decision will affect other products or practices in the future. Remember, cost management is an important component of the MEY principles.

## INTENSIVE CROP MANAGEMENT (ICM)

Farmers will continue to receive a variety of information on new concepts and products. These will likely not be the accepted or recommended production principles of the day. It is the farmers responsibility to seek out information, get expert advise and take responsibility for his decisions. A farmer must first, scrutinize and evaluate the validity of information and second, decide whether the implementation of such information is possible given his specific area and growing conditions.

The Saskatchewan Advisory Council on Soils and Agronomy urges farmers to approach ICM with care. In particular, the Council says to consider both economic and local environmental factors.

ICM was developed in Europe to maximize crop production by eliminating as many yield limiting factors as possible. These production systems are not directly applicable to Saskatchewan conditions; however, some of the principles of ICM may be adaptable to some crops and areas. ICM production systems provide the greatest potential under irrigation when moisture is not a limiting factor.

List the following ICM concepts under cost-high return or cost-low return potential for your area:

1. plant hybrids for higher yield potential
2. growth regulators to prevent lodging
3. infrared photography to show crop variation
4. plant tissue analysis to determine nutrient dificiency
5. split timing of high fertilizer rates for maximum yield
6. fungicides for disease control
7. use of tramlines to improve efficiency of pesticide application
8. seed at recommended rates of viable seeds per unit area rather than on a volume basis
9. narrow rows resulting in more uniform spacing

Initial results of ICM point to lack of moisture and short growing season in many areas as major limitations. Also, depressed commodity prices make ICM less appealing since much higher yields are needed to cover costs. At first, a farmer should try these new ideas on a small scale in order to limit possible failures and financial risk due to higher input costs.

## MEY SUMMARY

For a farmer to achieve a profit goal, he must have a complete and integrated crop production plan. He should establish realistic yield and profit goals and must commit time and effort to accomplish those goals. It will be critical for each manager to consider the interactions between all the various production practices and ensure they don't conflict or adversely affect another. A farm manager needs to plan each step in the crop production chain and determine the profit producing products and principles and implement them on his entire farm. He must take action, manage his costs and take responsibility for his risks. He needs to look into the future and carefully test the new innovations. Following these guidelines he can then produce his maximum economic yield.

## MEY CLUBS

If you wish to carry the concept of MEY further, a group of farmers could form a MEY or Producer Club. The objective of a club is to share ideas and results and therefore, learn not only from your

own successes and failures but also, from many other group members. A successful club does not have farmers competing. It emphasizes improvement in management and yield and the sharing of new knowledge. The club must be farmer operated with resource material coming from extension or other professionals.

Some considerations and characteristics are common among many of the successful clubs:

**1. LEADER**

He might be a farmer, a dealer or an extension agent but the important fact is that he can get a group to work together and share ideas.

**2. COMMITTED MEMBERS**

The members must believe in the goals and be willing to devote the time and effort required for group meetings and for their own plots.

**3. MANAGEABLE SIZE**

Most successful MEY clubs have 15 members or less. This allows in-depth analysis of each member's practices. A club's membership should be made up of farmers who have proven ability to manage. They must be able to analyse management practices and be prepared to consider and try new concepts.

**4. ON-FARM PLOTS**

MEY plots, on each member's farm, are important to obtain information. They represent each member's commitment to the club. Plots should be small enough to not be a financial burden but large enough to evaluate field-scale management.

**5. ORGANIZATION**

It has usually proven beneficial to have a formal organization, with elected officers and an established set of guidelines for the group.

**6. RECOGNITION**

While it is generally felt that a contest atmosphere detracts from the sharing of ideas in a MEY club, some means of recognition for excellence and achievement is often beneficial.

**7. GOALS**

The group as a whole and each individual member should establish a realistic, yet challenging yield goal.

**8. RECORDS**

The key to any successful MEY group is a good detailed record keeping system. Each farmer must maintain accurate, detailed records of management practices, production costs and weather information. Compiling record summaries and preparing an annual report will help encourage better records.

**9. FIELD MEETINGS**

Its essential to tour each member's field at least once in a season. Valuable discussions are stimulated by an individual's farming practices.

**10. MEMBER INVOLVEMENT**

Officers, planning committees, harvest checking, etc. are ways to get involvement and maintain member's interest.

**11. AGRIBUSINESS MEMBERS**

It may be desirable to have some key agribusiness representatives involved as associate members. It is important that they not be the dominant force in the club.

**12. COSTS**

The members should be willing to bear the expenses for their plots plus most of the expenses for the club. Some groups assess themselves a membership fee to cover the costs of meetings, meals, invited guests, etc.

**13. RESOURCE SPEAKERS**

Agribusiness representatives, extension staff, other farmers, etc. are an important source of information. A group of farmers are more likely to have access to their expertise than an individual.

The benefits of a club are numerous. Through the open sharing of ideas and results, your MEY information can be multiplied by the number of members.

## CONCLUSION

The maximum economic yield is only achieved through a complete and integrated management package. You must start with goals, plan and implement every step along the way and finally record and analyse the results. The production chain is only as strong as the weakest link. An improperly managed link in the system can negate

the entire effort. Remember it is a continuous chain and start to plan your crop at the previous harvest.

The MEY Management Package Checklist will assist you through a production plan. This checklist is applicable to every field on your farm.

The MEY Field Record Sheet will assist keeping permanent records and analysing your results. Its essential to maintain and update these records throughout the year. These records are necessary to forward plan your crop rotation. At year end, analyse your records and use them to plan for the future.

**Other Sources of Information**

This bulletin does not attempt to cover all the agronomic aspects involved in crop production. For this detailed information on any crop, contact the following:

I. Saskatchewan Department of Agriculture

1. Local Agricultural Representatives
2. Regional Soils and Crops Specialist
3. Soils and Crops Branch

3085 Albert Street
Walter Scott Building
Regina, S4S 0B1

II. Agriculture Canada

1. Research Stations

III. University of Saskatchewan, College of Agriculture

1. Crop Science Department
2. Soils Science Department
3. Agricultural Economics Department
4. Crop Development Centre

NOTE: This is not intended to be a complete list of the many resource people available. Numerous publications are available on economic and production recommendations.

# MEY MANAGEMENT PACKAGE CHECKLIST

1. Integrate production components to form a complete management package;

2. Positive interactions build maximum economic yields;

3. Pay "Attention to Detail" or "Precision Management";

4. Calculate which factors produce maximum return;

5. Ensure timeliness with every operation.

## I. HARVEST

1. straw and chaff management - even distribution for future seed bed preparation;

## II. FALL

1. plan rotation

   - continuous or flexible or summerfallow
   - consider disease, crop residue, herbicide residue
   - estimate available soil moisture from depth of moist soil and soil texture

2. fall cultivation

   - snow catch to maximize soil moisture
   - weed and grasshopper control
   - seed bed preparation

3. soil test

   - use proper sampling procedures

4. soil test interpretation

   - consider crop nutrient requirements, expected protein and yield levels, cropping history, tillage, residue management and local soil and climate

5. fertilizer application

   - ensure maximum benefit for investment
   - form (liquid, dry, gas)
   - analysis (46-0-0, 27-27-0, 21-0-0-24)
   - application method (band, broadcast, top dress, sideband)
   - timing (fall, spring, split application)
   - nutrient balance (principle of limiting factors)

6. herbicide application

   - implement a weed control plan
   - scout fields, identify and analyse
   - proper herbicide for maximum benefit
   - optimum stage and conditions
   - use recommended rates
   - proper application (field sprayer, spray-coupe, airplane)

## III. WINTER

1. analyse previous production practices

   - determine reasons for successes and failures
   - look back to plan ahead

2. gather information

   - use competent advisors

3. analyse markets

   - world inventories
   - examine alternatives
   - evaluate specialty crops
   - consider forward contracts
   - formulate market strategies
   - evaluate risks

4. forecast potential yield limiting factors and plan action to reduce their effects

5. consider early purchase discounts

6. implement a tax plan

   - early estimates of income tax payable

## IV. SPRING

1. finalize crop rotation plans

   - prices, yields, inputs, returns

2. choose varieties

   - yields, maturity, disease, adaptation, pest and lodging resistance

3. fertilizer application

   - ensure maximum benefit for investment
   - form (liquid, dry, gas)
   - analysis (46-0-0, 27-27-0, 21-0-0-24)
   - application method (band, broadcast, top dress, sideband)
   - timing (fall, spring, split application)
   - nutrient balance (principle of limiting factors)
   - moisture conservation
   - seed bed preparation

4. herbicide application

- implement a weed control plan
- scout fields, identify and analyse
- proper herbicide for maximum benefit
- optimum stage and conditions
- use recommended rates
- proper application (field sprayer, spray-coupe, airplane)

5. seed bed preparation

- timing, implement, weed control, moisture conservation and firmness

**V. SEEDING**

1. date

- optimum seeding dates

2. timing

- proper soil temperature for quick emergence

3. seeding implement

- uniform seed placement

4. certified seed

- maximum germination and seedling vigor

5. seed treatment

- reduce seedling stress

6. rate

- calculate viable seeds per unit area for proper plant populations

7. weed control

- winter annuals and early weeds

8. harrow and packing

- leveling, firm seed bed and moisture conservation

**VI. FIELD SCOUTING**

1. know the nutrient deficiency symptoms

2. plant tissue analysis

3. spot spraying

4. weed, disease and pest survey

**XVII. HERBICIDE APPLICATION**

- implement a weed control plan
- scout fields, identify and analyse
- proper herbicide for maximum benefit
- optimum stage and conditions
- use recommended rates
- proper application (field sprayer, spray-coupe, airplane)

**VIII. INSECTICIDE APPLICATION**

1. implement a pest control plan

2. scout fields, identify and analyse

3. proper pesticides for maximum benefit

4. optimum stage and conditions

5. use recommended rates

6. proper application

**IX. FUNGICIDE APPLICATION**

1. implement a disease control plan

2. scout fields, identify and analyse

3. proper fungicide for maximum benefit

4. optimum stage and conditions

5. use recommended rates

6. proper application

**X. GROWTH REGULATORS**

1. reduce potential of lodging

2. use at proper stage of growth for optimum benefit

**XI. SWATHING VERSUS STRAIGHT CUTTING**

1. "The Economics of Straight Combining" Department of Agriculture, Economics Branch

2. timeliness, grades, moisture content, drying, losses

**XII. COMBINING**

1. timeliness, proper setting and operations, grade, dockage, moisture content, drying, losses

## XIII. DRYING

1. change of moisture content, heat source, natural air drying, air temperature

## XIV. STORAGE

1. maintenance of facilities

2. monitor grain condition

## XV. MARKETING

1. implement marketing plan

2. adjust plan to changing circumstances

## XVI. SUMMERFALLOW

1. conventional

   - number of operations
   - moisture loss and/or gain
   - soil conservation (erosion)
   - timing of operations
   - grasshopper control

2. chemical fallow

   - soil conservation
   - number of operations
   - weed spectrum
   - snow catch
   - moisture loss and/or gain
   - timing of operations
   - grasshopper control
   - herbicide application

# MEY FIELD RECORD SHEET
# COST OF PRODUCTION WORKSHEET

**Precipitation**

| | Individual Rains* | | | | | | | | | | Total for Month |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Jan. | | | | | | | | | | | |
| Feb. | | | | | | | | | | | |
| March | | | | | | | | | | | |
| April | | | | | | | | | | | |
| May | | | | | | | | | | | |
| June | | | | | | | | | | | |
| July | | | | | | | | | | | |
| Aug. | | | | | | | | | | | |
| Sept. | | | | | | | | | | | |
| Oct. | | | | | | | | | | | |
| Nov. | | | | | | | | | | | |
| Dec. | | | | | | | | | | | |
| | | | | | | | | | | **Total for Year** | |

** One inch of snow equals approximately 1/10 inch of rain.*

## I. INTRODUCTION

Year
Field Name or Number
Legal Description
Acres
Previous Year's Use
Two Years Ago
Projected Yield

## II. SOIL TEST

Date _____
Cost _____ Soil Moisture Depth _____ Soil Available Moisture _____
Soil Test Available (lbs) N _____ P _____ K _____ S _____
Nutrients Applied (lbs) N _____ P _____ K _____ S _____
Total Required Nutrients N _____ P _____ K _____ S _____
Soil PH _____ Organic Matter _____ Conductivity _____
Soil Zone _____ Soil Type _____ Soil Class _____

## III. SEEDING

Date _____ Acres _____ Soil Temperature _____
Implement _____ # Hours _____ Cost _____
Variety _____ Seed Source _____
Seeding Rate _____ Cost _____
Seed Treatment _____ Rate _____ Cost _____
- effectiveness _____
Preseeding Implement _____ Date _____ #Operations _____ Cost _____
Post Seeding Implement _____ # Operations _____ Cost _____
Conditions - Soil _____
- Moisture _____
- Temperature _____

## IV. GROWING CONDITIONS

Number of Days to Emergence _____ Plant Population _____
Conditions - Moisture _____
- Temperature _____
Flowering Date _____ Heading Date _____

## V. FERTILIZER

| | Date | Type Application-Cost | Analysis | Rate | Actual N | P | K | S | Cost |
|---|---|---|---|---|---|---|---|---|---|
| 1. | | | | | | | | | |
| 2. | | | | | | | | | |
| 3. | | | | | | | | | |
| 4. | | | | | | | | | |

## VI. SPRAYS AND GRANULAR CROP PROTECTION PRODUCTS

| | Date | Problem | Type Application-Cost | Product | Rate | Cost | % Control |
|---|---|---|---|---|---|---|---|
| 1. | | | | | | | |
| 2. | | | | | | | |
| 3. | | | | | | | |
| 4. | | | | | | | |
| 5. | | | | | | | |
| 6. | | | | | | | |

## VII. CULTIVATION OPERATIONS

| | Date | Implement | % Weed Kill | # Hrs | Cost |
|---|---|---|---|---|---|
| 1. | | | | | |
| 2. | | | | | |
| 3. | | | | | |
| 4. | | | | | |
| 5. | | | | | |
| 6. | | | | | |

## VIII. HARVEST

Swathing Date _____ # Hours _____ Cost _____
- conditions _____
Combining Date _____ # Hours _____ Cost _____
- conditions _____
Drying Date _____ # Hours _____ Cost _____
Storage bin # _____
estimate grade and dockage _____ estimate moisture content _____
estimate bushels harvested _____ estimate yield/acre _____

## IX. MARKETING

| | Date | Trucking Cost | Purchaser | Quantity Sold | Price | Value |
|---|---|---|---|---|---|---|
| 1. | | | | | | |
| 2. | | | | | | |
| 3. | | | | | | |
| 4. | | | | | | |
| 5. | | | | | | |

Actual Grade _____ Actual Protein Content _____ Actual wt/bu _____
Actual bushels sold _____ Actual yield/acre _____

## X. EVALUATION

Actual Yield _____ Yield Goal _____
Total Variable Costs _____
Total Fixed Costs _____ Total Costs _____
Quantity Sold _____ Multiply Price _____
EQUALS Gross Income _____ Received
MINUS Total Costs _____ EQUALS NET INCOME _____

Cost per Bushel Production _____
Break-even Yield _____
Profit per Acre _____
Comments _____
Most High Yield Limiting Factors
Most MEY Limiting Factors
Recommendations for Future



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